

WHAT IS CLAIMED IS:

1. An exhaust-gas cleaning unit, comprising:
a particle filter; and
a nitrogen oxide store, the nitrogen oxide store being disposed upstream of the particle filter.

2. The exhaust-gas cleaning unit according to claim 1, wherein the exhaust-gas cleaning unit is configured for a diesel engine of a motor vehicle.

3. The exhaust-gas cleaning unit according to claim 1, further comprising an oxidation catalytic converter, the oxidation catalytic converter being disposed at least one of between the nitrogen oxide store and the particle filter, upstream of the nitrogen oxide store and downstream of the particle filter.

4. The exhaust-gas cleaning unit according to claim 1, wherein the particle filter includes a coating configured to perform one of an oxidation catalytic converter function, an HC/CO/O₂ storage function and a soot oxidation assisting function.

5. The exhaust-gas cleaning unit according to claim 1, further comprising a lambda probe disposed downstream of the particle filter.

6. A method for operating an exhaust-gas cleaning unit having a particle filter and a nitrogen oxide store disposed upstream of the particle filter, the method comprising the steps of:
performing a nitrogen oxide regeneration phase with, at least temporarily, a rich exhaust-gas composition for the nitrogen oxide store;

performing a sulphur regeneration phase with an elevated temperature and, at least temporarily, a rich exhaust-gas composition for the nitrogen oxide store; and

performing a soot regeneration phase with, at least temporarily, a lean exhaust-gas composition and an elevated exhaust-gas temperature for the particle filter;

wherein a longer period is provided for the sulphur regeneration phase than for the nitrogen oxide regeneration phase; and

wherein at least part of the sulphur regeneration phase and at least part of the soot regeneration phase are performed as a combined sulphur and soot regeneration phase, the combined sulphur and soot regeneration phase including one of:

a plurality of shorter intermittent sulphur regeneration phases during a longer soot regeneration phase;

a plurality of shorter intermittent soot regeneration phases during a longer sulphur regeneration phase;

a soot regeneration phase and a sulphur regeneration phase in immediate succession; and

a sulphur regeneration phase and a soot regeneration phase in immediate succession.

7. The method according to claim 6, wherein the exhaust-gas cleaning unit includes a lambda probe disposed downstream of the particle filter, the method further comprising the steps of:

monitoring the exhaust-gas composition with the lambda probe during the nitrogen oxide regeneration phase for a breakthrough of reducing agent, the breakthrough of reducing agent indicating an end of the nitrogen oxide regeneration phase; and

monitoring the exhaust-gas composition with the lambda probe during the soot regeneration phase for oxygen content, the oxygen content being indicative of an end of a soot burn-off.